

A comparison of the motivational factors between CrossFit participants and other exercise modalities

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### Abstract

*Objective:* Understanding exercise motives and participation is an essential aid in increasing exercise adherence and reducing comorbidities within populations. CrossFit is a fitness trend that has seen an explosive growth in popularity worldwide. However, little research has investigated the motivational factors within this “niche” or unconventional exercise environment. *Design:* The aim of this study was to explore the motivational factors of CrossFit participants in comparison to other group exercise participants, participants who exercise alone and those who exercise with personal trainers. *Method:* Using an independent group’s design, quantitative data was collected through opportunity sampling. A total of 314 male and female participants (CrossFit: n = 68, Group Exercise: n = 55, Alone: n = 125, Personal Trainer: n = 66), completed the exercise motivations inventor-2 (EMI-2) questionnaire. *Results:* The present study suggests that CrossFit participants were more likely to report higher levels of intrinsic motives, such as enjoyment, challenge and affiliation, whereas personal training clients reported higher values for health related motives such as positive health, ill-health avoidance and weight management. *Conclusion:* The findings suggest that the motivations for engaging in CrossFit may be similar to those seen in sport participation, and therefore may have an influence on facilitating long-term adherence in comparison with other exercise modalities. The article also discusses health related motives as being extrinsic in nature but reflecting intrinsic characteristics, potentially also facilitating long-term adherence. The present research helps develop further understanding of motivational variables within such exercise modalities.

Key words: High intensity, Group exercise, Personal Trainer, Intrinsic, Extrinsic

## Introduction

Physical activity is recognised to improve multiple physiological (Carrick-Ranson, 2014; Johns, et al., 2014) and psychological (Arazi et al. 2012; Singh et al. 1997; Tsutsumi, 1998) health parameters however it is estimated that only one third of adults in the UK currently meet recommended exercise guidelines (Department of Health, 2011). The indirect expenses alone of physical inactivity are reported to cost the NHS approximately £1.06 billion per year (Allender, 2007), and with an annual mortality rate of almost 3.3 million people, it is currently the fourth leading secondary cause of death in the world (Pratt et al. 2012). The development of interventions and strategies aimed to initiate physical activity are currently a vital part of health promotion, however to achieve the full benefits of exercise, it has been suggested that individuals must continue to be regularly active throughout their life, and therefore promoting long term involvement is crucial (Marcus et al. 2000; Biddle and Nigg 2000). Since research suggests that 50% of adults will discontinue an exercise programme within the first 6 months (Wilson and Brookfield, 2009), an area of importance exists in understanding the motives behind exercise participation.

Exercise motives, considered in context of self-determination theory (Deci & Ryan, 2000) can be thought of as predominantly intrinsic (the inherent satisfaction it provides, e.g. revitalization, enjoyment, challenge) or extrinsic (for outcomes they achieve or punishments avoided; social recognition, affiliation, competition, appearance; Maltby & Day, 2001). These motivation types are thought to lead to differing stress responses; intrinsic motives for exercise are suggested to lead to a release of stress, whereas extrinsic motives for exercise are thought to increase stress levels (Bakker, Whiting & van der Brug, 1997; Markland & Ingledew, 1997). Furthermore, in comparison to extrinsic goals, intrinsic goals have been found to be positively correlated to an individual's general well-being and happiness levels (Sheldon, et al. 2004). However, these motives are not as simply categorised as has been

previously been suggested; Vansteenkiste, et al. (2006) state that self-determination theory, citing Deci & Ryan (2000), suggests that physical fitness and health are intrinsic motives to exercise. However Deci and Ryan (2000) in fact suggest that identification with the importance of exercise for health would encourage exercise behaviour to become more a part of a person's identity and thus autonomous (associated with intrinsic motivation), whilst still being an extrinsic motive. The authors continue stating that motives based on identification (because the self has endorsed them) are likely to be better maintained and adhered to, irrespective of their possibly extrinsic nature. With this in mind whilst health and fitness parameters remain extrinsic motives by their very nature (e.g. they do not motivate for inherent satisfaction), they might be subject to characteristics of intrinsic as well as extrinsic motives. Furthermore motivation to exercise is not fixed, and individuals can progress from extrinsic to intrinsic motives, whereby the behaviour becomes more congruent with their sense of self and other values (Ingledeu & Markland, 2008). Generally, intrinsic motivation has been associated with higher levels of sustained engagement within activities notably within health promoting behaviours and exercise (Wilson et al. 2003; Wilson, Rodgers & Fraser, 2002).

Motivation and enjoyment factors within exercise have previously been well researched within a variety of group and individual exercise programmes (Louw, Van Biljon & Mugandani, 2012; Ingledeu & Markland, 2008). However, as the fashion of exercise modalities continues to grow more research is needed in order to understand exercise motives behind newer forms of exercise. CrossFit is one form of exercise modality that currently has a sparse research background in regards to exercise motives or behavioural responses within participants. It is recognised as a high-intensity, power training programme which combines elements of mobility, technique and strength (Smith et al. 2013), and has seen increasing popularity in recent years. CrossFit workouts often incorporate functional and Olympic lifts

such as the squat, deadlift, clean, snatch and overhead press. In addition, workouts often include elements of gymnastic exercises using hand-stands and rings. A large part of CrossFit workouts also consist of what is commonly known as the “Workout of the day” or “WOD”, where workouts are performed for a best time or performed in the “as many rounds as possible” style. The majority of workouts are done in a group environment, and some workouts are also completed as a shared workload.

Although it has been suggested that moderate intensity exercise produces higher adherence levels (Williams, et al. 2008), high intensity training has been shown as a more time efficient way of achieving the benefits of exercise (Buchheit and Larsen, 2013; Gibala, 2007). As such this might appeal to persons citing time restraints as a barrier (Trost, 2002). A recent study by Heinrich et al. (2014), found higher enjoyment factors and adherence levels in individuals in a high-intensity CrossFit group compared with an aerobic and resistance training group, despite spending significantly less time exercising (39hrs vs 189hrs). However, the study used a single-item scale of measuring enjoyment levels (from: ‘1’ being: strongly disagree to ‘5’: strongly agree for the statement, “I enjoy doing exercise”), and did not investigate other motivational factors or reasons for enjoyment.

The role of social support within an exercise environment has been cited as an important contributing factor to exercise initiation and adherence (Darlow and Xu, 2011; Tierney et al. 2011; Thomas, Jakicic and Gallagher, 2004; Hogman, 2005). A qualitative study conducted by Pridgeon and Grogan (2012) affirmed the importance of this within exercise as lack of social support was reported as a fundamental reason for dropout. Furthermore, group cohesiveness in team sports and group exercise environments have also been reported to produce higher levels of adherence (Bruner and Spink, 2011; Kwak et al. 2006). According to Allen’s (2005) social motivation theory, sport environments provide the opportunity for individuals to satisfy three social goals: affiliation, recognition and status.

Where the affiliation goal of building social connections is considered to be intrinsic in nature, the recognition and status goals can be seen as extrinsic and focused on social validation. This also challenges the categorisation of motives as being solely intrinsic or extrinsic; for example Allen (2005) suggests that affiliation can be an intrinsic motive whereas Maltby and Day (2002) have suggested it is more extrinsic in nature. In addition Markland and Ingledew (1997) suggest that less conventional motives for exercise such as social recognition are not so easily categorised and can be both intrinsic and/or extrinsic in nature.

The social nature of CrossFit, in addition to the annual ‘CrossFit Games’, which include national qualifying workouts and regional competitions, are what has led to CrossFit being described as the “Sport of Fitness” (Hak, Hodzovic and Hickey, 2013). With its origins being very much within a sport framework, aspects of team sport such as affiliation might have resulted in CrossFit seeing such an explosive growth in a short space of time. Compared with many other group exercise classes, where although the workouts are completed in a social setting, CrossFit programmes allow both novice and more advanced individuals to exercise together in a competitive and socially supportive environment, which is a consideration for enjoyment factors. Although adherence was not a factor, military teams have reported that CrossFit and similar programmes have helped develop camaraderie and teamwork (Bergeron et al. 2011).

While previous research has investigated motivational factors and enjoyment levels within CrossFit (Partridge, Knapp and Massengale, 2013; Heinrich et al. 2014), the nature of the motives for participants are yet to be examined in comparison to participants of alternative or more conventional exercise modalities. Therefore the aim of this study is to develop further understanding of the motivational factors, through the use of the exercise motivations inventory-2 (EMI-2) questionnaire (Markland and Ingledew, 1997), of CrossFit

participants compared with those from other group exercise programmes as well as persons who exercise independently and persons who exercise solely through one-to-one personal training.

## **Methodology**

### **Research Design**

The current study employed a quantitative approach to determine any differences in the motivational factors of four different exercise modalities. The method implemented an independent group's design, with the four different groups being CrossFit participants (CF), group exercise participants (G), participants who attend the gym alone (A) and persons who train one to one with a personal trainer (PT). The individual groups were determined at the beginning of the chosen questionnaire (EMI-2), by selecting one of the following options about themselves: "I mostly exercise in a CrossFit gym", "I mostly exercise in a group exercise setting that is not CrossFit (e.g. exercise classes)", "I mostly exercise alone", or "I mostly exercise one to one with a personal trainer".

### **Participants**

Upon obtaining approval from the relevant ethics committee, participants were recruited for the study through the use of opportunity sampling. An online questionnaire containing the EMI-2 (Markland and Ingledew, 1997) was created through the use of *Survey Monkey* and promoted on social media. Prior to completing the questionnaire, participants completed an initial page of informed consent, and were advised of the anonymity of the results. In addition, participants indicated their age, gender and current form of exercise (CF, G, A or PT) confirming that they had participated for >6 months. A total of 314 participants (males=132, females=182) completed the questionnaire, from the four categories: CrossFit; n=68 (39 males, 29 females), Group Exercise; n=55 (12 males, 43 females), Alone; n=125

(50 males, 75 females) and Personal Trainer; n=66 (31 males, 35 females). Data for the PT group was collected from a private fitness facility (Discover Strength, MN which uses only one-to-one and small group exercise under instruction. This way it could be guaranteed that these participants performed exercise in the required environment. Total participants ranged from the ages of 16-74, and the average age (mean  $\pm$  SD) of all participants was calculated to be  $36 \pm 12$  years. The mean ages of individual groups were: CrossFit ( $30.7 \pm 8.6$  years), Group Exercise ( $32.2 \pm 10.4$  years), Alone ( $33.2 \pm 10.3$  years) and Personal Trainer ( $47.9 \pm 12.7$  years).

### **Measurements of exercise motives**

Motives for participating in exercise were measured using the EMI-2 (Markland and Ingledew, 1997). The EMI-2 is a 51-item self-report questionnaire capable of measuring a broad range of exercise motives in adult males and females. It has a total of 14 subscales which consist of: stress management, revitalization, enjoyment, challenge, social recognition, affiliation, competition, health pressures, ill-health avoidance, positive health, weight management, appearance, strength and endurance, and nimbleness. Each of the scales from the EMI-2 demonstrates good internal reliability, ranging from 0.69 to 0.95, and there is strong support for the factorial validity of the instrument and invariance of the factor structure across gender (Markland and Ingledew, 1997).

The EMI-2 instructions ask the participant to indicate whether or not each item statement is true for them regarding exercise. The item stem reads, “Personally, I exercise (or might exercise)...” followed by specific reasons one might have to exercise. For the purpose of this study, this was modified to “Personally, I exercise...”, as participants were asked to complete the questionnaire only if they did participate in some form of exercise currently. The responses for each question are made on a 6-point Likert-type scale ranging from 0 (not

at all true for me) to 5 (very true for me). Each subscale in the EMI-2 questionnaire consists of multiple questions relevant to that category. Drawing on Deci & Ryan's (2002) self-determination theory, the EMI-2 allows researchers to differentiate between a variety of intrinsic and extrinsic exercise motives. In addition, The EMI-2 has proved to be both valid and reliable in its suitability for measuring motives within physical activity (Markland & Ingledew 1997).

### **Data Analysis**

Internal reliability of each EMI-2 sub-scale was examined using Cronbach's alpha (Cronbach, 1951). The independent variable examined within this study was 'group' (CF, G, A, PT) and the dependent variables the 14 subscales from the EMI-2. Dependent variables were tested for assumptions of normality of distribution by group factor using a Kolomogorov-Smirnov test. Assumptions of normality of distribution were violated for the majority of dependent variables in all groups and as such non-parametric analyses were used. A Kruskal-Wallis H test was conducted to test between group effects for each EMI-2 subscale. Where significant between group effects were found for dependent variables using the Kruskal-Wallis H test further post-hoc comparisons were performed between groups using Mann-Whitney U tests to identify the location of any between group differences. Planned comparisons were not made as this was deemed to be an exploratory and thus corrections for multiple comparisons were also not conducted. The factor 'gender' as also considered; however, due to the violation of assumptions of normality meaning that two factor parametric analysis of variance could not be performed, the above analyses were repeated upon both 'male' and 'female' sub groups. Statistical analysis was performed using IBM SPSS Statistics for Windows (version 20; IBM Corp., Portsmouth, Hampshire, UK) and  $p \leq 0.05$  set as the limit for statistical significance.

## Results

|                  |                  |                   |                  |
|------------------|------------------|-------------------|------------------|
| CrossFit         | Group Exercise   | Alone             | Personal Trainer |
| ( <i>n</i> = 68) | ( <i>n</i> = 55) | ( <i>n</i> = 125) | ( <i>n</i> = 66) |

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Satisfactory internal reliability statistics were found with Crobachs alpha ranging 0.739 to 0.936 for all scales with the exception of Health Pressures ( $\alpha = 0.524$ ). Item deletion for this scale did not results in an increased alpha. These findings are consistent with the psychometric properties reported by the scales authors whereby health pressures was found to have the lowest internal reliability (Markland and Ingledew, 1997).

### Combined males and Females

Results from the Kruskal-Wallis H test revealed significant between group effects for age ( $\chi^2_{(3)} = 70.109, p < .001$ ). Post-hoc Mann-Whitney U tests revealed statistically significant differences between PT and both CF ( $U = 626.50, p < 0.001$ ), G ( $U = 609.00, p < 0.001$ ), and A ( $U = 1528.00, p < 0.001$ ).

Significant between group effects were also found for all EMI-2 subscales with the exception of Revitalisation; Stress Management ( $\chi^2_{(3)} = 8.921, p = .030$ ), Enjoyment ( $\chi^2_{(3)} = 31.903, p < .001$ ), Challenge ( $\chi^2_{(3)} = 33.682, p < .001$ ), Social Recognition ( $\chi^2_{(3)} = 15.738, p = .001$ ), Affiliation ( $\chi^2_{(3)} = 120.060, p < .001$ ), Competition ( $\chi^2_{(3)} = 19.763, p < .001$ ), Health Pressures ( $\chi^2_{(3)} = 19.758, p < .001$ ), Ill-Health Avoidance ( $\chi^2_{(3)} = 30.709, p < .001$ ), Positive Health ( $\chi^2_{(3)} = 16.286, p = .001$ ), Weight Management ( $\chi^2_{(3)} = 9.788, p = .020$ ), Appearance ( $\chi^2_{(3)} = 14.636, p = .002$ ), Strength and Endurance ( $\chi^2_{(3)} = 27.434, p < .001$ ) and Nimbleness ( $\chi^2_{(3)} = 20.705, p < .001$ ). Table 1 presents the descriptive statistics and results for post-hoc Mann-Whitney U tests for between group comparisons for all EMI-2 subscales.

|                      | Median (IQR)      | Median (IQR)    | Median (IQR)  | Median (IQR) |
|----------------------|-------------------|-----------------|---------------|--------------|
| Affiliation          | 3.75 (1.88) * † ‡ | 2.75 (1.75) † ‡ | 0.75 (1.75)   | 1.00 (1.75)  |
| Appearance           | 3.00 (1.31) ‡     | 3.25 (1.63) ‡   | 3.25 (1.75) ‡ | 3.75 (1.50)  |
| Challenge            | 3.88 (1.50) * † ‡ | 3.25 (1.50) ‡   | 2.75 (1.75)   | 2.88 (2.19)  |
| Competition          | 2.50 (2.81) † ‡   | 2.75 (3.25) † ‡ | 1.75 (2.75)   | 1.50 (2.25)  |
| Enjoyment            | 4.50 (1.50) * † ‡ | 3.75 (1.50) ‡   | 4.00 (2.00) ‡ | 3.25 (2.00)  |
| Health Pressures     | 1.00 (1.42) ‡     | 1.33 (1.33) ‡   | 0.67 (1.67) ‡ | 1.33 (1.67)  |
| Ill-Health Avoidance | 3.00 (1.67) ‡     | 3.33 (2.00) ‡   | 3.33 (1.67) ‡ | 4.33 (1.33)  |
| Nimbleness           | 3.67 (1.33) * †   | 3.33 (1.83)     | 3.00 (1.67) ‡ | 3.67 (1.67)  |
| Positive Health      | 4.33 (1.00) ‡     | 4.33 (1.33) ‡   | 4.33 (1.33) ‡ | 4.67 (0.67)  |
| Revitalisation       | 4.00 (1.00)       | 4.00 (1.33)     | 4.00 (1.67)   | 3.67 (1.58)  |
| Social Recognition   | 2.25 (2.13) † ‡   | 1.75 (2.00)     | 1.50 (2.00)   | 1.25 (2.00)  |
| Strength & Endurance | 4.25 (1.00) * †   | 3.75 (1.69) ‡   | 3.75 (1.50) ‡ | 4.50 (1.00)  |
| Stress Management    | 3.50 (1.88) ‡     | 3.50 (1.75) ‡   | 3.25 (2.00) ‡ | 2.63 (2.00)  |
| Weight Management    | 3.50 (1.81) ‡     | 3.75 (2.00) ‡   | 3.75 (2.00) ‡ | 4.25 (1.50)  |

Table 1: Median data for combined male and female participants for all independent groups

\* Denotes  $p < 0.05$  compared to Group Exercise. † Denotes  $p < 0.05$  compared to Alone. ‡ Denotes  $p < 0.05$  compared to Personal Trainer.

### Males Only

Significant between group effects were also found for the EMI-2 subscales of; Enjoyment ( $\chi^2_{(3)} = 23.296, p = .000$ ), Challenge ( $\chi^2_{(3)} = 14.664, p = .002$ ), Affiliation ( $\chi^2_{(3)} = 48.906, p = .000$ ), Competition ( $\chi^2_{(3)} = 12.541, p = .006$ ), Health Pressures ( $\chi^2_{(3)} = 12.488, p = .006$ ), Ill-Health Avoidance ( $\chi^2_{(3)} = 14.660, p = .002$ ), Positive Health ( $\chi^2_{(3)} = 13.275, p = .004$ ), Weight Management ( $\chi^2_{(3)} = 21.702, p = .000$ ), Appearance ( $\chi^2_{(3)} = 19.946, p = .000$ ), Strength and Endurance ( $\chi^2_{(3)} = 19.006, p = .000$ ) and Nimbleness ( $\chi^2_{(3)} = 15.109, p = .002$ ). Table 2 presents the descriptive statistics and results for post-hoc Mann-Whitney U tests for between group comparisons for all EMI-2 subscales in males.

### **Females Only**

Significant between group effects were also found for the EMI-2 subscales of; Enjoyment ( $\chi^2_{(3)} = 14.332, p = .002$ ), Challenge ( $\chi^2_{(3)} = 20.259, p = .000$ ), Social Recognition ( $\chi^2_{(3)} = 14.208, p = .003$ ), Affiliation ( $\chi^2_{(3)} = 71.297, p = .000$ ), Competition ( $\chi^2_{(3)} = 9.593, p = .022$ ), Health Pressures ( $\chi^2_{(3)} = 8.112, p = .044$ ), Ill-Health Avoidance ( $\chi^2_{(3)} = 15.761, p = .001$ ) and Strength and Endurance ( $\chi^2_{(3)} = 13.198, p = .004$ ). Table 3 presents the descriptive statistics and results for post-hoc Mann-Whitney U tests for between group comparisons for all EMI-2 subscales in females.

Table 2: Median data for male participants for all independent groups

|                         | CrossFit<br>(n=39) | Group Exercise<br>(n=12) | Alone<br>(n=50) | Personal Trainer<br>(n=31) |
|-------------------------|--------------------|--------------------------|-----------------|----------------------------|
|                         | Median ( IQR)      | Median (IQR)             | Median (IQR)    | Median (IQR)               |
| Affiliation             | 3.25 (1.63) †<br>‡ | 3.13 (0.94) † ‡          | 0.88 (1.75)     | 0.75 (2.38)                |
| Appearance              | 2.75 (1.00) ‡      | 2.25 (1.13) ‡            | 3.25 (1.75) ‡   | 3.75 (1.50)                |
| Challenge               | 4.00 (1.75) †<br>‡ | 3.25 (0.94)              | 3.25 (2.00)     | 2.50 (1.75)                |
| Competition             | 3.50 (2.25) ‡      | 3.00 (1.00) ‡            | 2.38 (2.69)     | 1.50 (2.25)                |
| Enjoyment               | 4.50 (1.50) * ‡    | 3.50 (0.56) †            | 4.00 (1.50) ‡   | 3.25 (2.00)                |
| Health Pressures        | 1.00 (1.33) ‡      | 0.83 (0.92)              | 1.00 (1.67) ‡   | 2.00 (1.83)                |
| Ill-Health Avoidance    | 3.33 (1.83) ‡      | 3.50 (0.58) ‡            | 3.33 (2.00) ‡   | 4.33 (1.33)                |
| Nimbleness              | 4.00 (1.50) * †    | 3.00 (1.42)              | 3.00 (2.00) ‡   | 3.67 (1.67)                |
| Positive Health         | 4.33 (1.00) *      | 4.00 (0.58) † ‡          | 4.33 (1.33) ‡   | 4.67 (0.67)                |
| Revitalisation          | 4.00 (1.00)        | 3.33 (0.50)              | 4.00 (1.67)     | 3.33 (1.50)                |
| Social Recognition      | 2.25 (2.00)        | 1.38 (1.31)              | 1.50 (1.69)     | 1.25 (2.25)                |
| Strength &<br>Endurance | 4.25 (1.13) *      | 3.50 (0.94) † ‡          | 4.00 (1.00) ‡   | 4.50 (1.00)                |
| Stress Management       | 3.50 (1.75)        | 3.38 (1.94)              | 3.13(1.69)      | 2.75 (2.38)                |
| Weight Management       | 3.25 (2.25) ‡      | 2.88 (2.00) ‡            | 3.00 (1.50) ‡   | 4.25 (1.50)                |

\* Denotes  $p < 0.05$  compared to Group Exercise. † Denotes  $p < 0.05$  compared to Alone. ‡ Denotes  $p < 0.05$  compared to Personal Trainer.



Table 3: Median data for female participants for all independent groups

|                         | CrossFit<br>( <i>n</i> =29) | Group Exercise<br>( <i>n</i> =43) | Alone<br>( <i>n</i> =75) | Personal Trainer<br>( <i>n</i> =35) |
|-------------------------|-----------------------------|-----------------------------------|--------------------------|-------------------------------------|
|                         | Median (IQR)                | Median (IQR)                      | Median (IQR)             | Median (IQR)                        |
| Affiliation             | 4.50 (1.00) * † ‡           | 2.50 (2.25) † ‡                   | 0.75 (1.75)              | 1.00 (1.25)                         |
| Appearance              | 3.50 (1.50)                 | 3.25 (1.25)                       | 3.25 (1.75)              | 3.75 (1.63)                         |
| Challenge               | 3.75 (1.00) * † ‡           | 3.25 (1.50) †                     | 2.50 (1.75)              | 3.00 (2.38)                         |
| Competition             | 2.00 (1.75) † ‡             | 2.25 (3.38) † ‡                   | 1.25 (2.50)              | 1.25 (1.88)                         |
| Enjoyment               | 4.50 (1.25) ‡               | 4.25 (1.50) ‡                     | 4.00 (2.50)              | 3.25 (1.88)                         |
| Health Pressures        | 0.67 (1.67) ‡               | 1.33 (1.50)                       | 0.67 (1.67) ‡            | 1.33 (1.50)                         |
| Ill-Health Avoidance    | 2.67 (1.66) ‡               | 3.00 (2.50) ‡                     | 3.33 (1.33) ‡            | 4.33 (1.17)                         |
| Nimbleness              | 3.67 (1.00)                 | 3.67 (2.00)                       | 3.00 (1.67)              | 3.67 (1.67)                         |
| Positive Health         | 4.33 (4.00)                 | 4.33 (1.67)                       | 4.33 (1.33)              | 4.67 (0.67)                         |
| Revitalisation          | 4.00 (1.67)                 | 4.00 (1.67)                       | 3.67 (2.00)              | 3.67 (1.50)                         |
| Social Recognition      | 2.25 (2.25) † ‡             | 1.75 (2.13)                       | 1.25 (1.75)              | 1.50 (2.00)                         |
| Strength &<br>Endurance | 4.25 (0.75) †               | 3.75 (1.50) ‡                     | 3.75 (1.63) ‡            | 4.50 (1.00)                         |
| Stress Management       | 3.50 (2.00)                 | 3.50 (1.75)                       | 3.25 (2.38)              | 2.50 (1.88)                         |
| Weight Management       | 3.55 (1.50)                 | 4.00 (1.75)                       | 4.25 (1.50)              | 4.25 (1.63)                         |

\* Denotes  $p < 0.05$  compared to Group Exercise. † Denotes  $p < 0.05$  compared to Alone. ‡ Denotes  $p < 0.05$  compared to Personal Trainer.

## Discussion

The purpose of the study was to compare the motivational factors between persons participating in CrossFit (CF), group exercise (G), exercising alone (A) and those who use a personal trainer (PT). Results reveal multiple significant differences for many of the items on the EMI-2 between the groups considered.

### Affiliation

Results of the analysis revealed that when considered as combined male and female participants persons participating in CF exercise showed higher motives for affiliation compared to G, A and PT. In addition persons performing G exercise reported higher motives for affiliation compared to A and PT. These results are likely due to the similarities between CrossFit and team sport and are consistent with previous research on group exercise citing affiliation as a strong motive to exercise (Ingledeew and Markland, 2008). However, interestingly G scored significantly lower than CF when considered as combined males and females and females only suggesting that CrossFit as an exercise format might be more focused on relatedness than other group exercise settings. From a sociological perspective Dawson (2015) has questioned the ‘cult’ association to CrossFit and discusses that CrossFit better resembles a reinventive institution (RI) described as *“one to which members voluntarily commit themselves, willingly discarding their former identities to pursue transformative regimes of self-improvement and identity reinvention”*. Certainly the present data suggests strong attachments to this exercise modality when compared to G, A and PT environments. Within the social goals of Allen’s (2005) social motivation theory, the affiliation goal has been described as a key characteristic to motivation and goal directed behaviour (Allen, 2003; Hodge, Allen & Smellie, 2008). This is, at the least in part, a result of individuals being attracted to social environments that allow them to fulfil the need for

autonomy, a sense of belonging, and relatedness; defined as “*caring for and feeling cared for by others*” (Deci and Ryan, 2002).

When we begin participating in exercise as children at school, we are encouraged to interact with our classmates in sports to create social bonds (Kinchin 2006;), rather than exercising individually. This same structure may be reflected in sporting environments and exercise modalities such as *CrossFit*. Affiliation as an exercise motive is reflected in young children, and has been noted as one of the most attractive features of sport participation within students (Grant, Treddinick, and Hodge 1992). Fulfilment of relatedness in team sports can encourage motivation, adherence and enjoyment within physical education in schools (Cox, Duncheon, and McDavid 2009; Wallhead, Garn and Vidoni, 2013; McCarthy, Jones and Clark-Carter, 2008), and similar feelings of relatedness could suggest why CrossFit participants ranked affiliation and enjoyment higher than other groups. Team sport environments where individuals develop a sense of belonging appear to suggest significantly greater enjoyment factors due to the intrinsic nature of the motivation, which has been most highly endorsed in exercise maintenance (Buckworth et al. 2007). Whilst some sports and unstructured group exercise (such as CrossFit) support interaction among individuals, it may be that other more structured group exercise settings (e.g., Spinning, circuits, aerobics etc.) may not offer such opportunities for communication and connection within group members, thus decreasing affiliation levels. Since the environment of CrossFit promotes social interaction and support, it may suggest that individuals can facilitate the intrinsic motivation to fulfil internally pleasing social experiences in order to support their sense of relatedness with others.

### **Social Recognition and Competition**

Where affiliation is classified as an intrinsic goal, social recognition is derived from extrinsic reasons of receiving attention from others for physical abilities (Wallhead, Garn and Vidoni, 2013; Hodge, Allen, and Smellie 2008). Although CrossFit ranked the highest for social recognition, this was not significant between CrossFit and group exercise, suggesting that social recognition may also be an equally motivating factor for group exercise participants. However, despite this, males in group exercise ranked the overall lowest for social recognition (table 2). This may be due to most group exercise classes reported as having dominantly female attendees (Ransdell, Vener, & Sell, 2004; Fishwick & Hayes, 1989), which was true for the group exercise participants of the study (m=12, f=43). However, conversely, there were more males in the CrossFit group than females (m=39, f=29). This may relate further to the conception of CrossFit's similarities to sport, as research shows that more males are likely to participate in sport than females (Pharr and Lough, 2014).

Although social recognition can be classed as extrinsic and therefore potentially detrimental to adherence (Markland and Ingledew, 2007), Allen's (2005) social motivation theory suggests that if the environment generates sufficient validation from others, when coinciding with feelings of affiliation, social recognition will produce positive outcomes such as higher levels of interest and effort within sport (Allen, 2005; Garn et al. 2011). Conversely, social recognition can also produce competitive behavioural outcomes should necessary validation and affiliation be absent within the group (Hodge, Allen, and Smellie 2008). However, the effect of competitiveness has been shown to be dependent on the individual and the level of extrinsic value orientation they hold (Duriez, Meeus and Vansteenkiste, 2012). For example, Frederick-Recasino (2013), found that competitiveness within a social environment positively influenced enjoyment levels and adherence to exercise. Although there was no statistically significant difference between CF and G in

competition as a motive, in comparison to A and PT participants, competition was notably higher. This is not unusual, as competitiveness has been shown to be higher within group settings (Gill, 1986). However, it may be that levels of competition, affiliation and social recognition due to group environments in both CrossFit and group exercise have direct effects on other motives such as enjoyment levels (Allen, 2005).

### **Enjoyment and Challenge**

CrossFit ranked significantly higher than all groups in combined male and female participants for enjoyment as a motivational factor (table 1). When considering CrossFit is comparable to a sport, this finding is consistent with previous research by Frederick and Ryan (1993), who found that individuals whose primary physical activity was a sport reported higher interest and enjoyment motives than individuals whose primary activity was a non-sport fitness activity. Higher enjoyment ratings may also be reflective of the high intensity interval structure of CrossFit. Whilst some studies have reported lower enjoyment levels in association with higher intensity levels, Tjønnå et al. (2008), found significantly higher reports of enjoyment in a high intensity interval running group in comparison with a moderate intensity continuous running group. Furthermore, Patience et al. (2013) found that more intense sports elicited higher enjoyment in 11-14 year olds. Although adherence levels were not monitored within the study, exercise enjoyment has been shown to be positively correlated with hours per week of exercise and length of workouts (Frederick and Ryan, 1993). Wankel, (1993), suggests that intrinsic motivations such as exercise enjoyment, leads to increased persistence, reduced stress and positive psychological feelings, leaving one more likely to feel energized, confident and satisfied in the activity itself (Frederick and Ryan, 1993). In addition, that social motives such as affiliation may contribute to exercise adherence due to social interaction adding to enjoyment.

Challenge was also ranked significantly higher in combined male and female CrossFit participants and female only participants in comparison to G, A and PT groups (table 3). This finding is similar to that of Hanrahan and Cerin, (2009), who found females reported higher task mastery goals for exercise whereas males reported higher competitive (or ego based) goals. Positively correlated with intrinsic motivation, task driven behaviour is described in the Achievement Goal Theory (Nicholls 1984; Dweck and Legget, 1988) as behaviour related to the individual mastering new skills and improving personal performance. Task-orientated individuals self-reference their performance, whereas ego-orientated individuals are extrinsically motivated by outperforming others (Kim, Duda, and Gano-Overway, 2011). The unique context of CrossFit may facilitate either personal challenges or interpersonal-based competition within individuals. Task-orientated individuals or environments tend to elicit challenging tasks and encourage persistence and personal development, which is shown to be associated with better psychosocial and performance outcomes than more ego-orientated environments (Ames, 1992). As CrossFit participants ranked higher in both the aspects of competition and challenge, it may suggest CrossFit could appeal to both ego and task-oriented individuals, which may add to the explanation of the recent popularity of this exercise format.

### **Positive Health, Health Pressures and Ill Health Avoidance**

The PT group rated positive health, health pressures and ill-health avoidance as a significantly more important motive for exercise compared to CF, G and A groups. Health related motives have previously been interpreted as both extrinsic (Deci and Ryan, 2000) and intrinsic (Vansteenkiste et al. 2006) motives. However, as discussed earlier they might best be considered extrinsic motives which represent similar adherence characteristics to intrinsic motives because of identification and self-endorsement (Deci and Ryan, 2000). Certainly we

can recognise that a person wishing to exercise under the one to one supervision of an exercise professional is not seeking to derive autonomy from their exercise regime.

It is also worthy of consideration to discuss the potential injury risk associated with CrossFit (Hak, Hodzovic and Hickey, 2013) in context of health. Authors have previously discussed a high prevalence of injury associated with CrossFit and likened it to gymnastics and Olympic lifting (due to the nature of the exercises) as well as that of contact sports (Fisher, et al. 2014). With this in mind it seems logical that persons choosing to participate in CrossFit might be prepared to undertake the risks associated with sports participation where persons exercising in a more controlled environment with a trained professional might rate health parameters such as injury avoidance more importantly.

### **Appearance, Weight Management and Strength and Endurance**

The PT group also scored appearance and weight management a higher motivator than CF, G and A groups in combined males and females and male only analyses. Notably there were no significant between group differences in the female only participants suggesting that weight management and appearance was equally important irrespective of exercise format. Stronger motivations in weight management and appearance in females seems appropriate, as physical appearance has been shown in earlier research to be a higher motivating factor in women than in men (Keating et al. 2005; Kilpatrick, Herbert and Bartholomew, 2005; Louw, Van Biljon and Mugandani, 2012). Appearance and weight management are extrinsic motives for exercise and have been associated with higher levels of dropout and lower levels of adherence (Frederick and Ryan, 1993; Markland and Ingledew, 2007). According to Markland and Ingledew (2007), weight management and appearance motivations are extrinsic due to their controlling nature, and are less likely to promote long-term exercise maintenance when compared with intrinsic motivations. Ingledew et al. (1998)

found, in a longitudinal study of British government employees, that although appearance and weight management were prominent motivations during initiation, motivations of enjoyment and revitalisation were most important for progressing to maintenance of exercise. Moreover, appearance and weight management motives have been linked with negative body image (Ingledeew and Sullivan, 2002) and negative affect (Maltby and Day, 2001).

These findings are reflective of previous research comparing differences in motivations within sports and non-sports participants. Frederick and Ryan (1993), compared the motives of a large sample of individuals who either participated in “individual sports” or “exercise/fitness activities”. Their results suggested that sport participants cited enjoyment and competence as the highest motivating factors, whereas exercise participants reported more body-related motives such as appearance, more important. Ryan et al. (1997), found similar results when comparing the motives of participants in aerobics and martial arts classes. Furthermore, a study by Kilpatrick, Herbert and Bartholomew (2005), found that competition, affiliation, enjoyment and challenge were highest rated in sports participants, whereas health and appearance related motives were highest in exercise. These findings support that participation in sports is more related to intrinsic motivations, whereas non-sport activities are associated with mostly extrinsic motivations.

However, we should consider these extrinsic motives factors from a larger perspective. For example previous research suggests that exercising with a personal trainer improves adherence compared to exercising without a personal trainer (Arikawa et al. 2011; Dishman, 2001; Grubbs et al. 2002; Netz et al. 2008). Furthermore, that health parameters such as strength and weight loss are improved when exercise is supervised (Jeffery et al. 1998; Maloof et al. 2001; Ratamess et al. 2008; Wadden et al. 1998). As such, whilst extrinsic motives such as weight loss and appearance might generally be associated with poor

long-term adherence, the addition of a personal trainer and the superior accomplishments as a result of supervised exercise might counteract an increased dropout rate.

It should be noted that whereas the mean age of CrossFit participants was 30.7 years (IQR= 12.25), the mean age of Personal Training participants was significantly higher (47.2 IQR= 19.75 years). This could greatly influence motivational aspects, as age has been shown to influence exercise motives within individuals. De Andrade Bastos et al (2006), considered exercise motives in adults aged 16-60 years, and reported that younger participants rated enjoyment and social experience of higher importance whereas older adults rated health benefits higher. However, conversely, the study also found that younger adults reported higher ratings of appearance as a motive, whereas this was not seen in the present study when considering CrossFit as a significantly younger group. Both CF and PT reported strength and endurance a higher motive to their exercise than G and A participants. This finding supports the previous discussion of CrossFit as a sport where performance and function are more important than appearance. However, strength and endurance might also be recognised within health parameters within the present participants, since muscle mass and physiological function is a marker for biological aging (Srikanthan & Karlamangla, 2014).

### **Personality Traits**

It has previously been argued that personality traits may influence health-promoting behaviours such as exercise, although not all findings are consistent (Vollrath and Torgersen, 2002). Roberts and Robins (2000), have suggested that an individual's goals can be influenced by their own personality traits and in turn, allow the individual to form their own social environment in ways that reinforce these. This could suggest that certain modalities of exercise may attract certain personality archetypes who express different motivations. For example, extrovert individuals, who enjoy social activities, may prefer to exercise within a

group setting such as team sports or CrossFit. Alternately, introvert personalities may choose solitary or less social physical activities such as exercising alone or one to one with a trainer. Nevertheless, research on the personality of sports participants versus non-sports participants is somewhat contradictory. For instance, research has reported no differences between athletes and non-athletes in extraversion (Vealey, 2002; McKelvie, Lemieux, and Stout, 2003), where other research has reported that athletes demonstrate generally higher levels of extraversion than non-athletes (Egloff and Gruhn, 1996). In addition to this, participants who engage in team sports have been shown to produce significantly higher levels of extraversion than individual sports or non-sports participants (Allen et al. 2011, Malinauskas et al. 2014). This could suggest that where more introverted or withdrawn individuals may look to more solitary forms of exercise, more outgoing or extroverted individuals should look to more social types of exercise.

### **Conclusion**

The present study considers the exercise motives of persons choosing different modalities of exercise (CrossFit, Group, Alone or with a Personal Trainer). The main findings of intrinsic motivation (e.g. enjoyment and challenge) ranking higher in persons performing CrossFit support the underpinning nature of CrossFit as a sport. In contrast persons who exercise one to one with a personal trainer reported higher health related motives (e.g. positive health, health pressures and ill health avoidance) which might be recognised as extrinsic motives but are thought to reflect some intrinsic characteristics as a result of identification and self-endorsement. Since the group exercising with a personal trainer were significantly older than the other groups this might also represent changing motives with age. In order to assist people in choosing the most suitable exercise modality, it seems that a deeper understanding of different people and their motives can be beneficial in helping increase adherence.

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